

# USER'S MANUAL

**TwinFresh R-50**



**SINGLE-ROOM REVERSIBLE  
VENTILATOR**

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## INTRODUCTION

This user's manual includes technical description, operation, installation and mounting guidelines, technical data for the single-room reversible ventilator TwinFresh R-50, hereinafter referred as the unit.

## USE

The unit is designed to arrange permanent controllable air exchange in flats, cottages, hotels, cafes and other domestic and public premises.

The unit is equipped with a ceramic heat exchanger that enables supply of fresh air due to extract air heat energy utilization.

The unit heat exchange efficiency reaches 91%.

The unit is designed for through-the-wall mounting. The unit is suitable for installation in the walls from 120 mm (4 3/4") up to 1160 mm (45 11/16"), depending on the unit configuration.

The unit is rated for continuous operation.

Transported medium must not contain any flammable or explosive mixtures, evaporation of chemicals, coarse dust, soot and oil particles, sticky substances, fibrous materials, pathogens or any other harmful substances.

The unit is designed operation at the ambient temperature ranging from -20°C (-4 °F) up to +50°C (+122 °F).

The unit delivery set depending on the model is shown in tables 1-3.

## DELIVERY SET

Table 1

Delivery	TwinFresh R-50	TwinFresh RA-50	TwinFresh RA-50 (120V/60Hz)	TwinFresh R-50-M	TwinFresh RA-50-M	TwinFresh RA-50-M (120V/60Hz)	TwinFresh R-50-L	TwinFresh RA-50-L	TwinFresh RA-50-L (120V/60Hz)	TwinFresh R-50-1	TwinFresh RA-50-1	TwinFresh RA-50-1 (120V/60Hz)	TwinFresh R-50-1M	TwinFresh RA-50-1M	TwinFresh R-50-1L (120V/60Hz)	TwinFresh R-50-1L	TwinFresh RA-50-1L
TwinFresh R-50 unit	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Power cable, 3 m Unitronic LIYY UL CSA 5xAWG/7 (5x0.25)	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Control and power unit		+	+		+	+		+	+		+	+		+	+		+
User's manual	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Packing box	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Fasteners	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+



Table 2

[illegible]

Table 3

[illegible]

## UNIT DESIGNATION KEY

## TwinFresh RX-50-XX (XXX/XX)

## Power main parameters other than 230 V / 50 Hz

## Connecting air duct (telescope) air duct length

- \_ - 250 - 470 mm (9 13/16" - 18 1/2");  
**M** - 470 - 720 mm (18 1/2" - 28 3/8");  
**L** - 720 - 1160 mm (28 3/8" - 45 11/16").

## Outer grille (outer hood) type

- \_ - metal outer hood;  
**1** - round stainless steel outer hood;  
**2** - metal tapered outer hood for 120-470 mm (4 3/4" - 18 1/2") air duct;  
**3** - plastic round grille;  
**4** - plastic rectangular grille;  
**5** - ductwork system 204x60 mm (8 1/16" - 2 3/8") with an end plastic grille.

## Air capacity [m³/h]

## Control unit

- \_ - no control unit included;  
**A** - control unit included.

## Round connecting air duct

## Unit designation

**TwinFresh** – single-room reversible ventilator

## TECHNICAL PARAMETERS

The main unit overall and connecting dimensions, outer view and technical parameters are shown in fig. 1-6 and in tables 4-10.

Table 4

Mode	Voltage	Power [W]	Air capacity [m³/h] (CFM)	RPM [min⁻¹]	Noise level, 3 m [dB(A)] (Sones)	IP
1	230 V / 50 Hz (120V / 60 Hz)	1,4	25(14,7)	570	22(0,5)	24
2		3,0	50(29,4)	1100	29(0,81)	



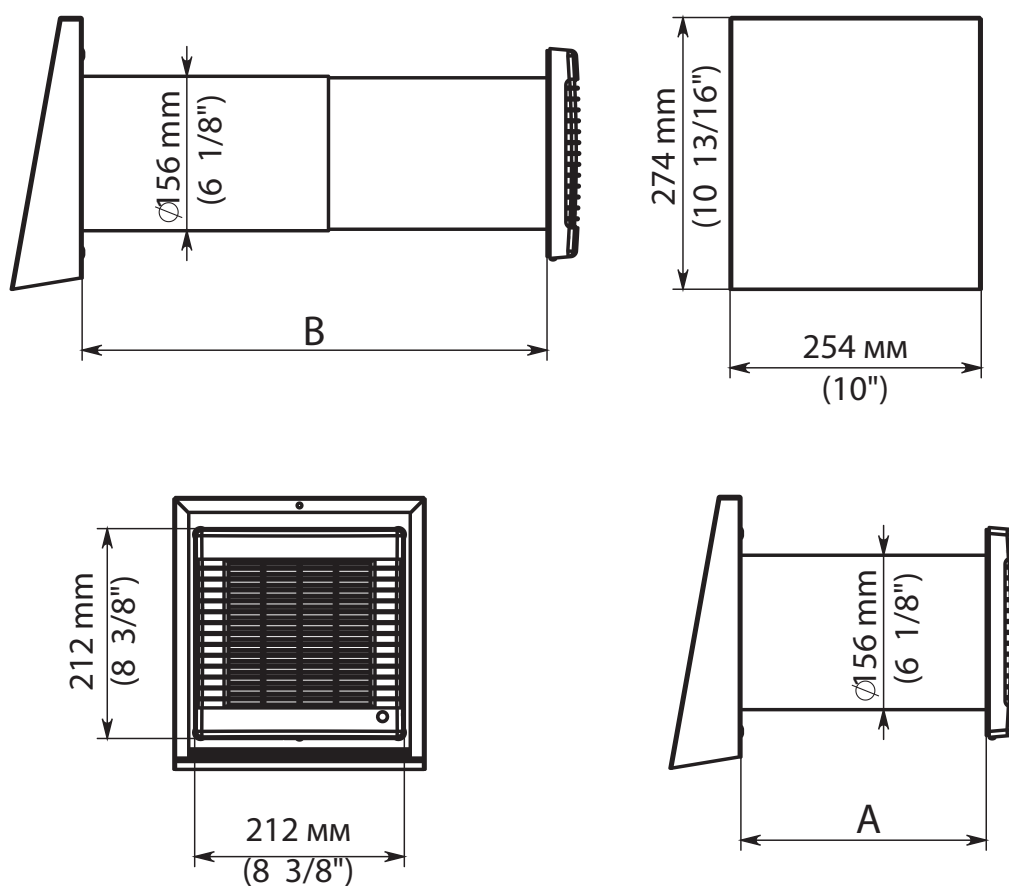


Fig. 1. TwinFresh R-50 overall and connecting dimensions

Table 5

Unit modifications	A		B	
	mm	inch	mm	inch
TwinFresh R-50	250	$9 \frac{13}{16}''$	470	$18 \frac{1}{2}''$
TwinFresh RA-50				
TwinFresh RA-50 (120V/60Hz)				
TwinFresh R-50-M	470	$18 \frac{1}{2}''$	720	$28 \frac{3}{8}''$
TwinFresh RA-50-M				
TwinFresh RA-50-M (120V/60Hz)				
TwinFresh R-50-L	720	$28 \frac{3}{8}''$	1160	$45 \frac{11}{16}''$
TwinFresh RA-50-L				
TwinFresh RA-50-L (120V/60Hz)				

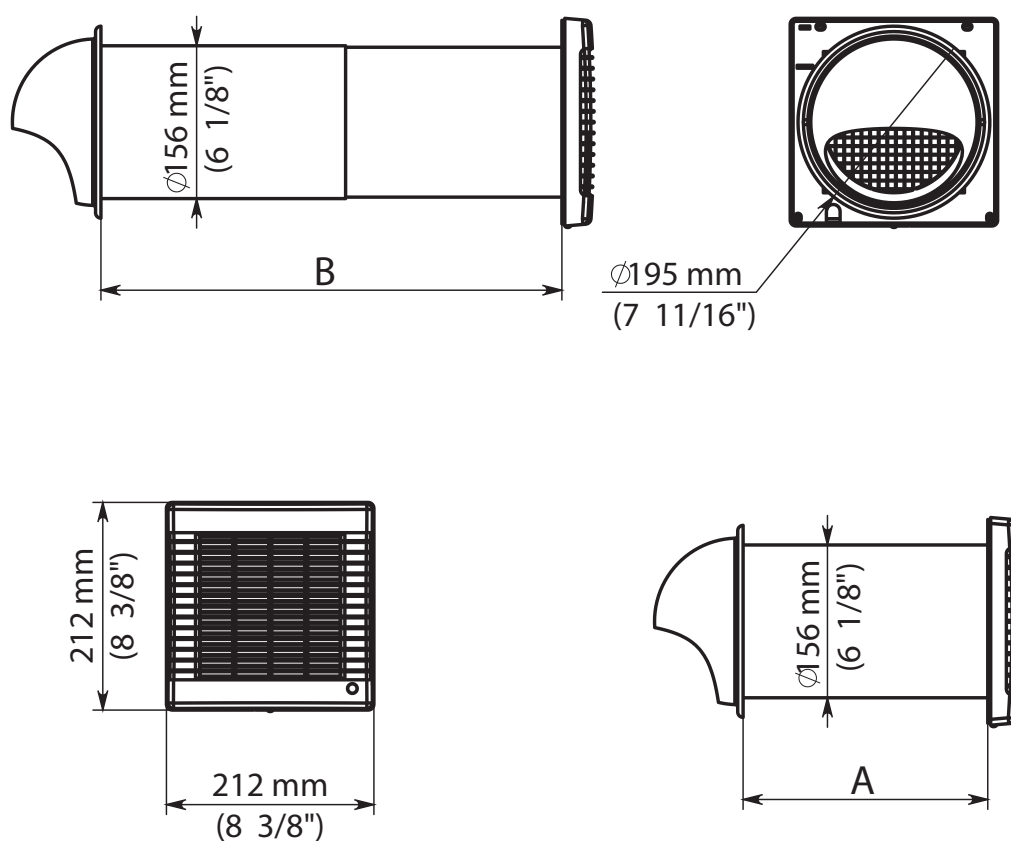


Fig. 2. TwinFresh R-50-1 overall and connecting dimensions

Table 6

Unit modifications	A		B	
	mm	inch	mm	inch
TwinFresh R-50-1	250	9 13/16"	470	18 1/2"
TwinFresh RA-50-1				
TwinFresh RA-50-1 (120V/60Hz)				
TwinFresh R-50-1M	470	18 1/2"	720	28 3/8"
TwinFresh RA-50-1M				
TwinFresh RA-50-1M (120V/60Hz)				
TwinFresh R-50-1L	720	28 3/8"	1160	45 11/16"
TwinFresh RA-50-1L				
TwinFresh RA-50-1L (120V/60Hz)				

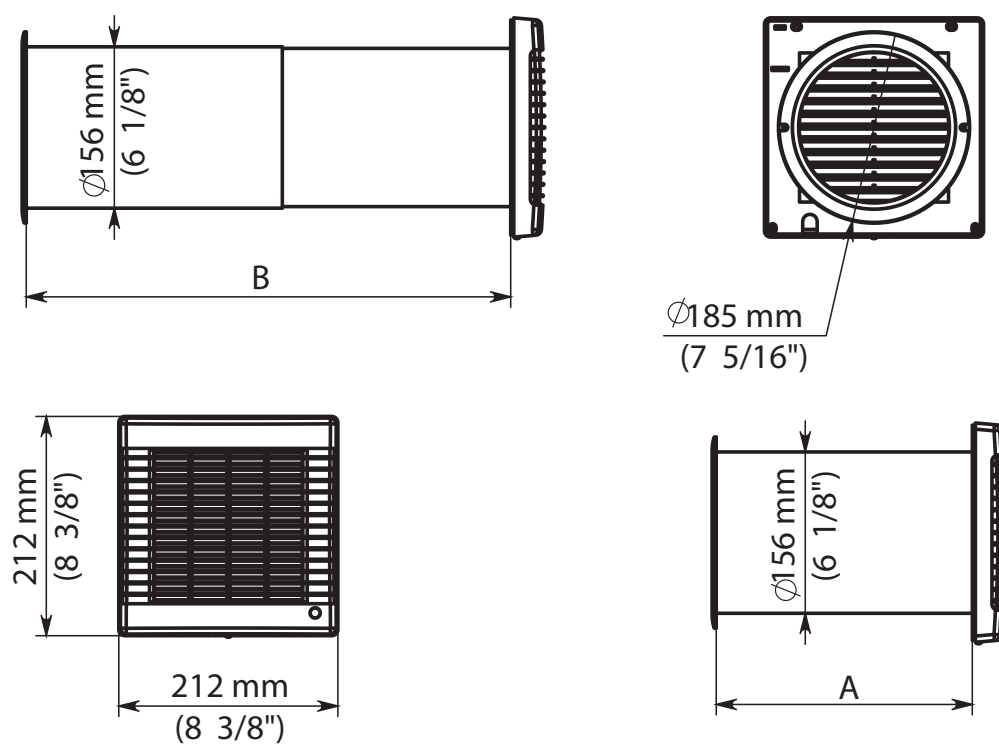


Fig. 3. TwinFresh R-50-3 overall and connecting dimensions

Table 7

Unit modifications	A		B	
	mm	inch	mm	inch
TwinFresh R-50-3	250	$9 \frac{13}{16}''$	470	$18 \frac{1}{2}''$
TwinFresh RA-50-3				
TwinFresh RA-50-3 (120V/60Hz)				
TwinFresh R-50-3M	470	$18 \frac{1}{2}''$	720	$28 \frac{3}{8}''$
TwinFresh RA-50-3M				
TwinFresh RA-50-3M (120V/60Hz)				
TwinFresh R-50-3L	720	$28 \frac{3}{8}''$	1160	$45 \frac{11}{16}''$
TwinFresh RA-50-3L				
TwinFresh RA-50-3L (120V/60Hz)				



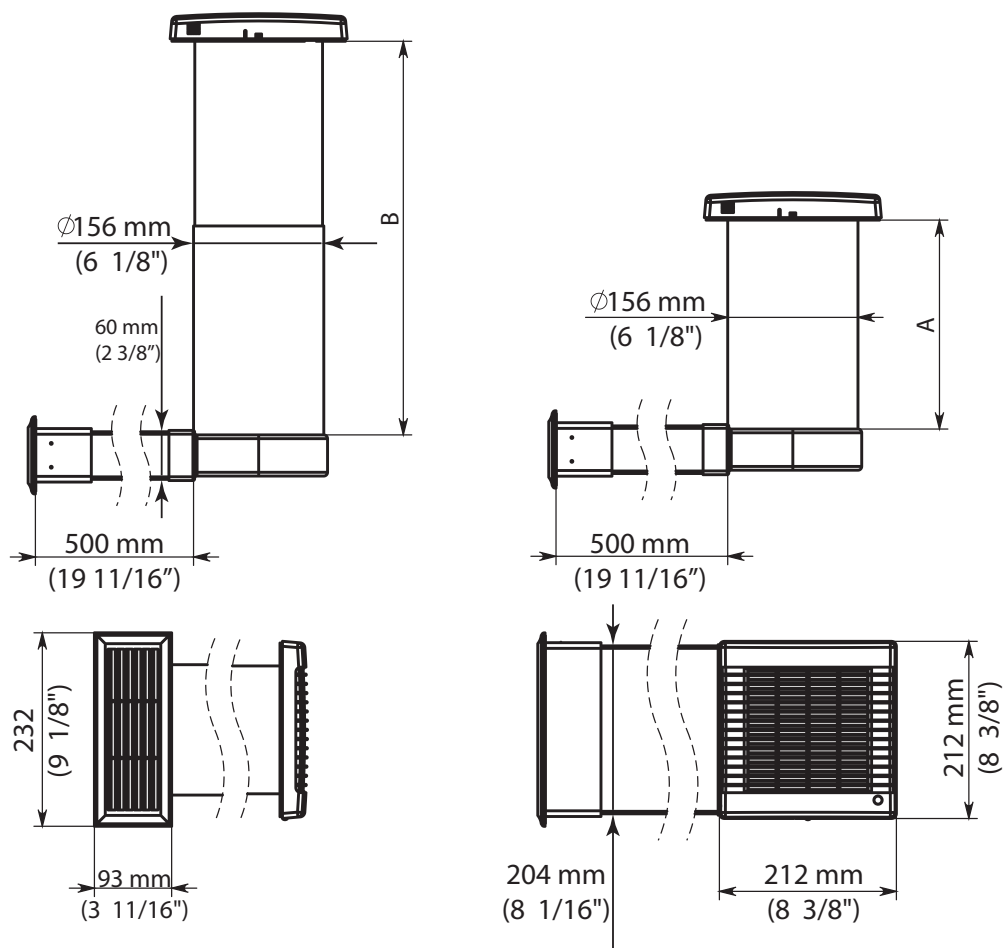


Fig. 4. TwinFresh R-50-5 overall and connecting dimensions

Table 8

Unit modifications	A		B	
	mm	inch	mm	inch
TwinFresh R-50-5	250	9 13/16"	470	18 1/2"
TwinFresh RA-50-5				
TwinFresh RA-50-5 (120V/60Hz)				
TwinFresh R-50-5M	470	18 1/2"	720	28 3/8"
TwinFresh RA-50-5M				
TwinFresh RA-50-5M (120V/60Hz)				
TwinFresh R-50-5L	720	28 3/8"	1160	45 11/16"
TwinFresh RA-50-5L				
TwinFresh RA-50-5L (120V/60Hz)				

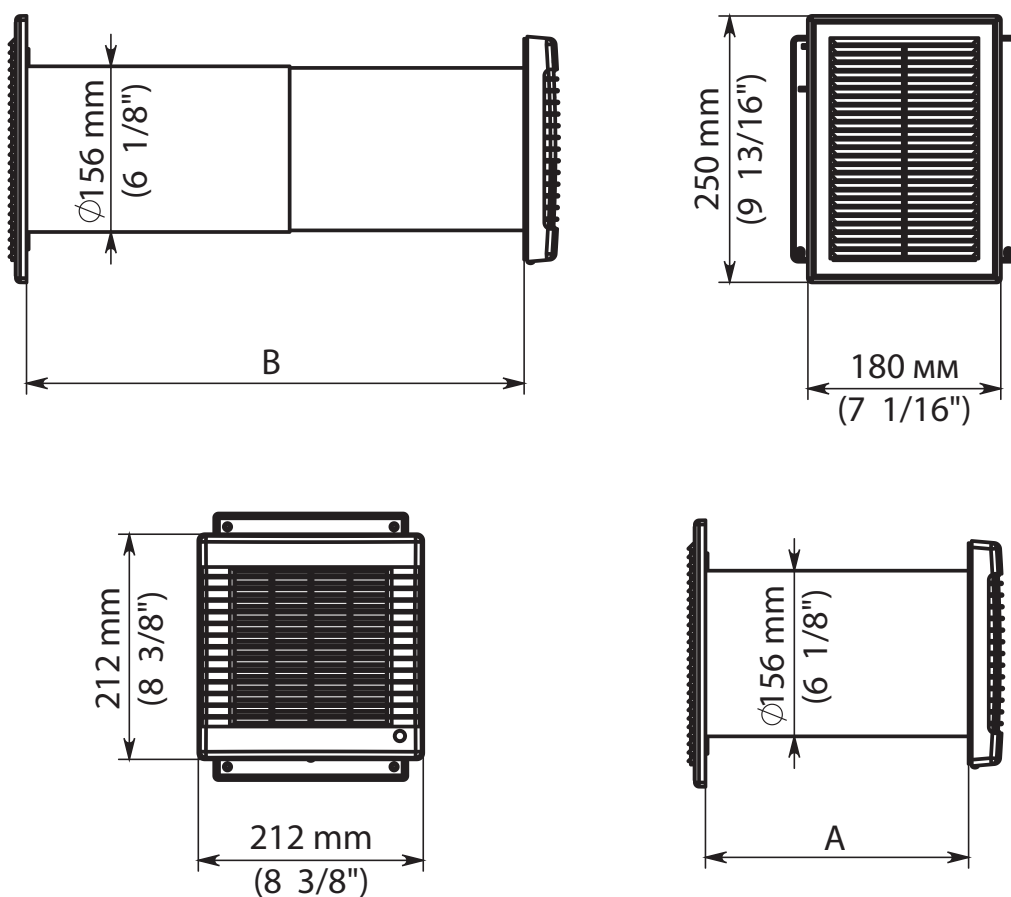


Fig. 5. TwinFresh R-50-4 overall and connecting dimensions

Table 9

Unit modifications	A		B	
	mm	inch	mm	inch
TwinFresh R-50-4	250	9 13/16"	470	18 1/2"
TwinFresh RA-50-4				
TwinFresh RA-50-4 (120V/60Hz)				
TwinFresh R-50-4M	470	18 1/2"	720	28 3/8"
TwinFresh RA-50-4M				
TwinFresh RA-50-4M (120V/60Hz)				
TwinFresh R-50-4L	720	28 3/8"	1160	45 11/16"
TwinFresh RA-50-4L				
TwinFresh RA-50-4L (120V/60Hz)				

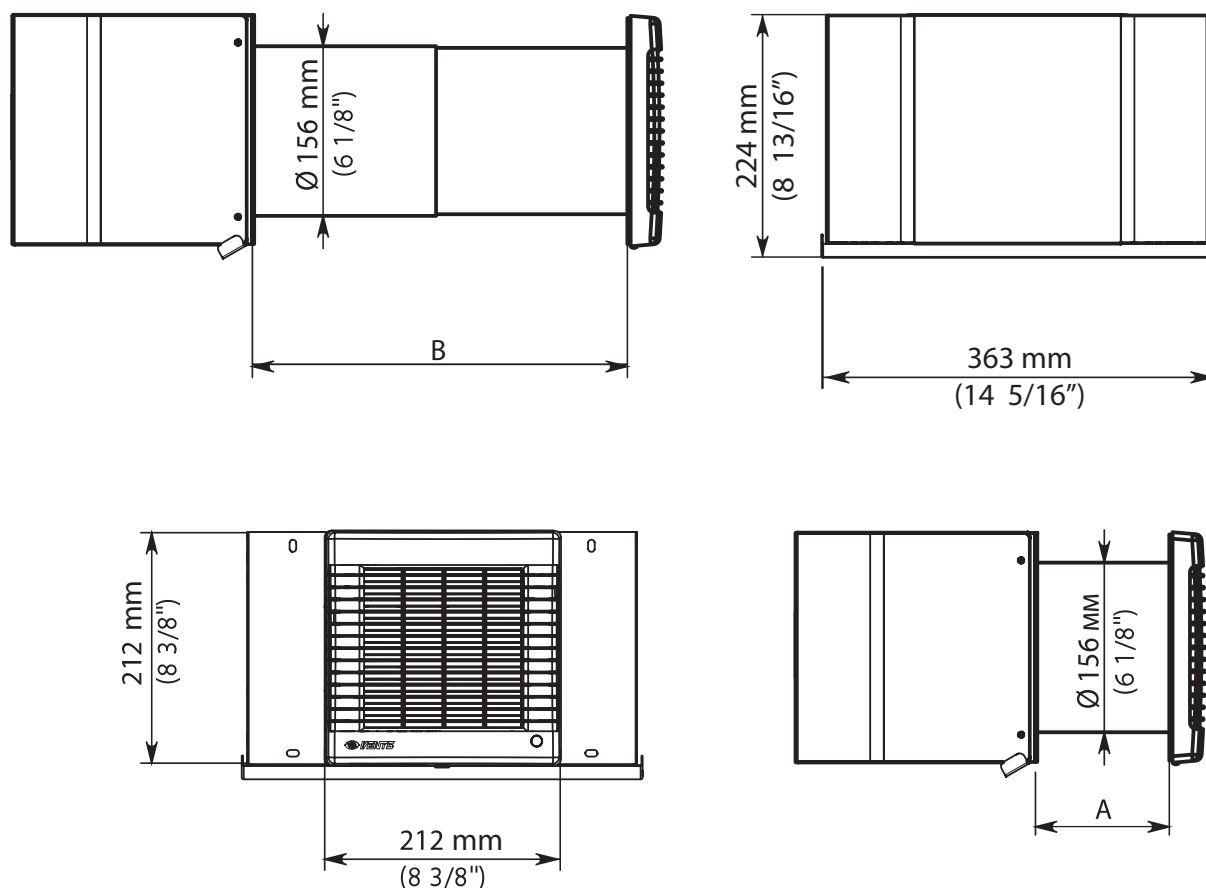


Fig. 6. TwinFresh R-50-2 overall and connecting dimensions

Table 10

Unit modifications	A		B	
	mm	inch	mm	inch
TwinFresh R-50-2	120	4 4/4"	470	18 1/2"
TwinFresh RA-50-2				
TwinFresh RA-50-2 (120V/60Hz)				

## SAFETY REQUIREMENTS



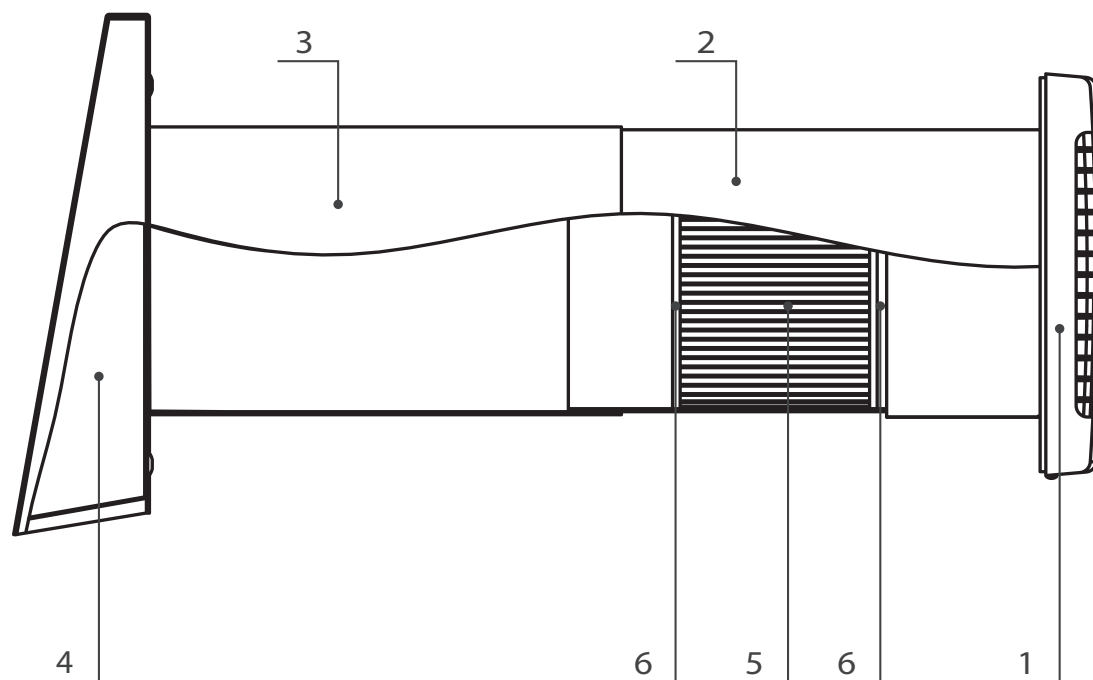
**WARNING!**  
DISCONNECT THE UNIT FROM POWER SUPPLY BEFORE MOUNTING AND REPAIR OPERATIONS. MAKE SURE THE IMPELLER DOES NOT MOVE.

Before connecting the unit to power mains make sure that the casing is free of any visible damages and foreign objects inside that can damage the impeller blades. Otherwise please contact the seller.



**WARNING! THE UNIT IS NOT RATED FOR OPERATION IN EXPLOSIVE OR FIRE-HAZARDOUS MEDIA. MAKE MEASURES TO PREVENT POSSIBLE GAS BACK DRAFTING FROM GAS OR OPEN FLAME DEVICES. WARNING: THE UNIT MAY HAVE SHARP EDGES AND ANGLES. TAKE STEPS TO PREVENT PHYSICAL INJURIES DURING MAINTENANCE AND REPAIR OPERATIONS.**

# DESIGN AND OPERATING LOGIC



- 1 - ventilation unit with a decorative grille - 1 item
- 2 - inner telescopic air duct - 1 item
- 3 - outer telescopic air duct - 1 item
- 4 - outer hood (cover, back wall with a pipe) or an outer plastic grille, depending on the unit modifications - 1 item
- 5 - ceramic heat exchanger - 1 item
- 6 - Filter - 2 items

Fig. 7. Unit design

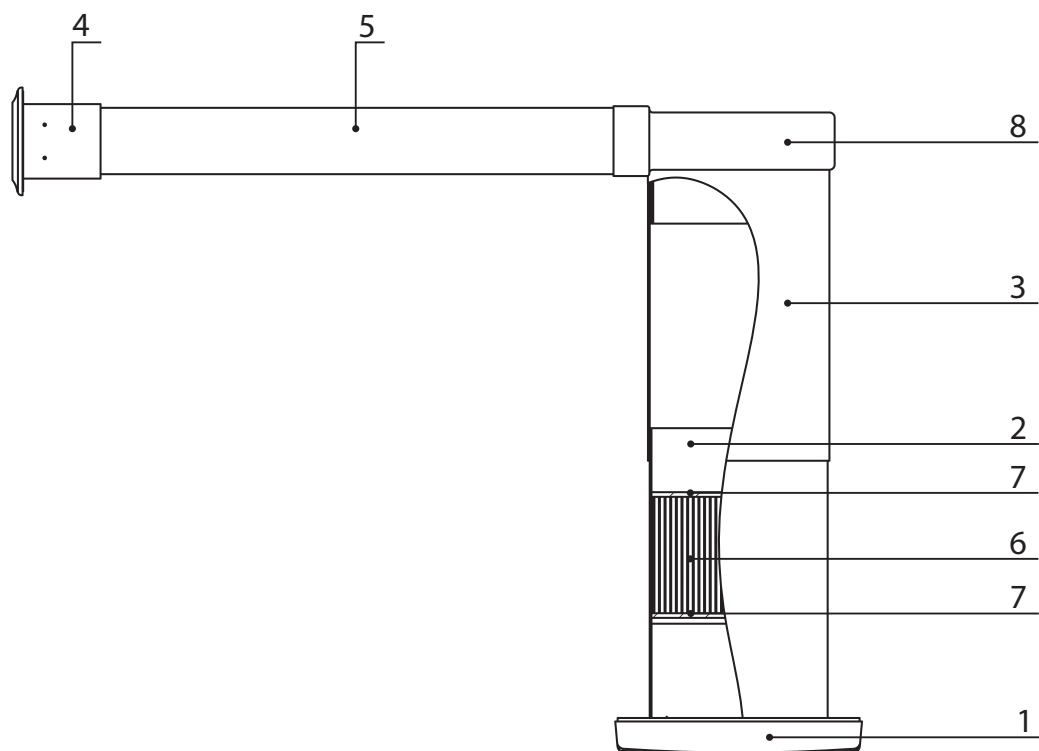
The unit consists of a plastic telescopic air duct (2) and (3), a ventilation unit with a decorative grille (1) and an outer hood (4), refer fig. 7. A plastic ventilation grille may be used instead of a metal outer hood, depending on the unit modification.

The total telescopic air duct length is regulated due to position of the inner telescopic duct (2) inside the outer telescopic duct (3).

Two filters 7 and a ceramic heat exchanger (5) are installed in the inner telescopic air duct. The inner filter is designed for supply air cleaning and prevention of dust and foreign objects ingress inside the heat exchanger and the impeller. The heat exchanged is used to warm up supply air flow by extract air heat energy and provide supply of warmed-up and filtered air to the room. The heat exchanger has a pull cord inside to facilitate its maintenance.

The ventilation unit with a decorative grille (1) and automatic shutters are to be installed on inner room side on the ventilator casing.

The outer hood (4) or the plastic ventilation grille (depending on the unit modification) is to be installed on the outer building side to prevent ingress of water and solid foreign objects.



- 1 – Ventilation unit with a decorative grille (1 item);
- 2 – Inner telescopic duct (1 item);
- 3 – Outer telescopic duct (1 item);
- 4 – Plastic grille (1 item);
- 5 – Rectangular plastic air duct (1 item);
- 6 – Ceramic heat exchanger (1 item);
- 7 – Filter (2 items);
- 8 – Plastic connecting bend (1 item).

Fig. 8. Unit design

The TwinFresh R-50-5 unit consists of the plastic telescopic air duct 2 and 3, the ventilation unit with a decorative grille (1), the plastic connecting bend (8), the rectangular plastic air duct (5) and an outer plastic grille (4), fig. 8.

The TwinFresh R-50-5 unit is a telescopic unit with an adjustable length that is regulated due to position of the inner telescopic duct (2) inside the outer telescopic duct (3).

Two filters (7) and the ceramic heat exchanger (6) are installed in the telescopic duct, inside the inner part. The heat exchanger provides warming up of supply air flow with extract air heat energy. The filters are installed on both sides of the heat exchanger, fig. 8 and serve to purify supply air and prevent ingress of foreign objects inside the heat exchanger.

The ventilation unit with a decorative grille (1) and automatic shutters is installed on the unit casing inside the room. Due to the plastic connecting bend (8) and the flat plastic air duct (5) the unit TwinFresh R-50-5 is suitable for angular mounting. The plastic ventilation grille (4) is installed from outside to prevent direct ingress of water and large objects to the unit.

## MOUNTING AND SET-UP

The unit is designed for installation into a specially designed through hole inside a wall. The hole must be perpendicular to the wall plane.

The mounting guidelines are shown in fig. 9.

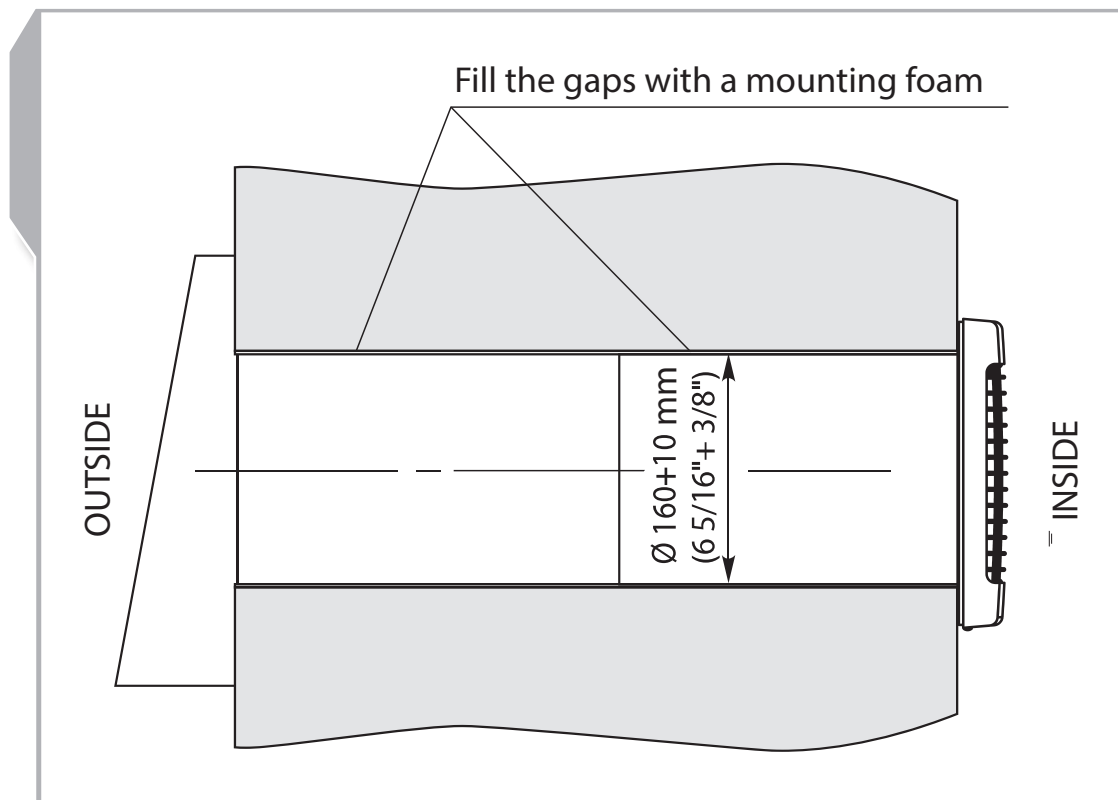


Fig. 9. Unit mounting

Install the telescopic duct in the hole from outside and fill the gaps between the duct and the wall with a mounting foam. For easy mounting keep the clearances between the duct and the wall within 5-10 mm ( $\frac{3}{16}''$ - $\frac{3}{8}''$ ).

Fix the outer hood according to the wall holes with four 4x35 screws and the dowels 6x35 included into delivery set, fig. 10.

Fix the ventilation unit to the wall with the screws 3x25 included into delivery set and the dowels 5x25, fig. 11. The mounting sequence for other unit modifications is the same, fig. 11-12.

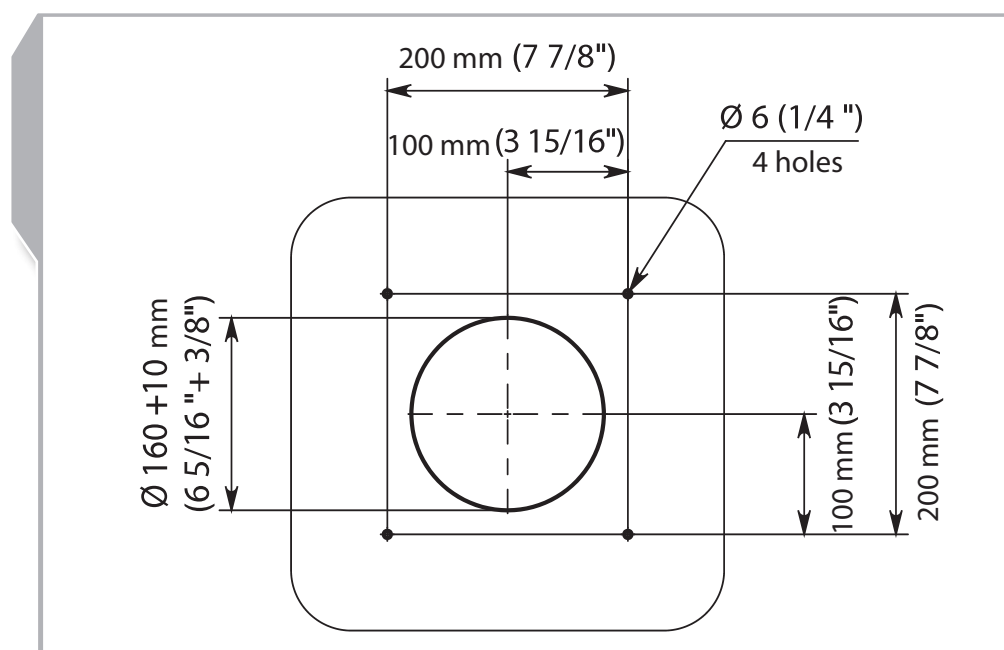
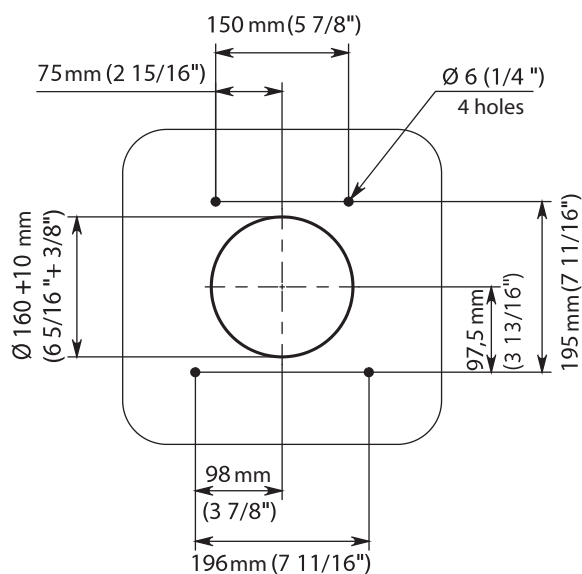
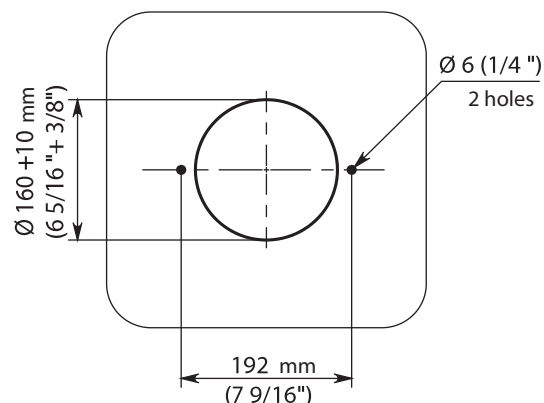


Fig. 10. Hole spacing for the outer hood fastening for TwinFresh R-50.

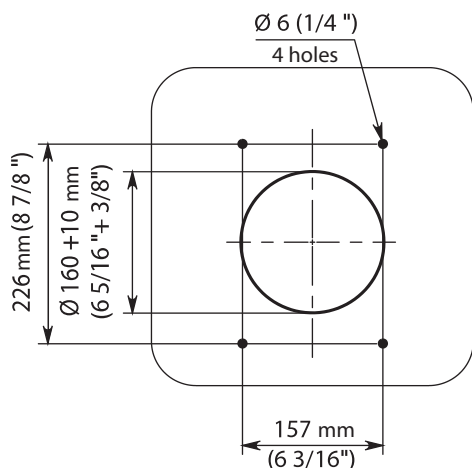
Hole spacing for fastening of the ventilation unit  
for all unit modifications.



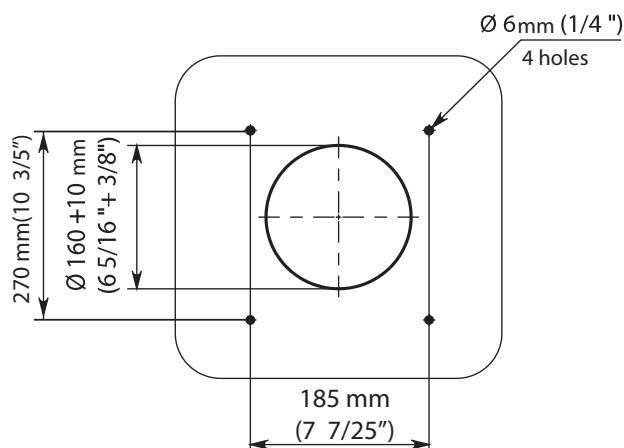
Hole spacing for fastening of the external grille  
for TwinFresh R-50-1



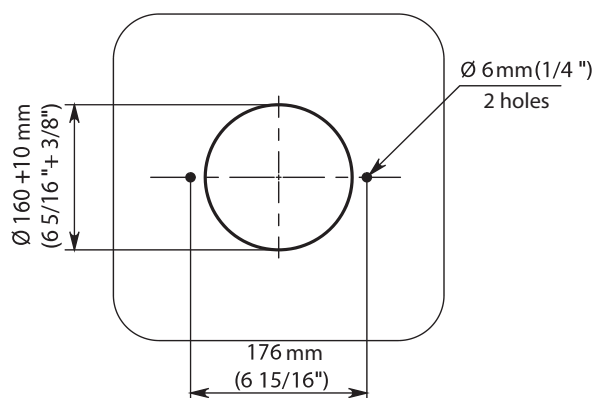
Hole spacing for fastening of the external grille  
for TwinFresh R-50-4



Hole spacing for fastening of the outer hood  
for TwinFresh R-50-2  
with the mounting plate, refer table 2.



Hole spacing for fastening of the outer hood  
for TwinFresh R-50-3



Hole spacing for fastening of the outer hood  
for TwinFresh R-50-5

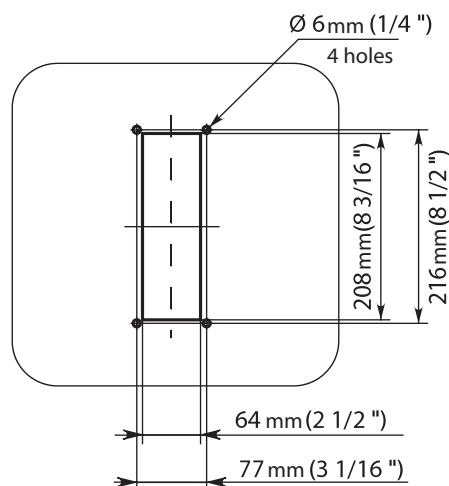


Fig. 11. Hole spacing for the unit mounting

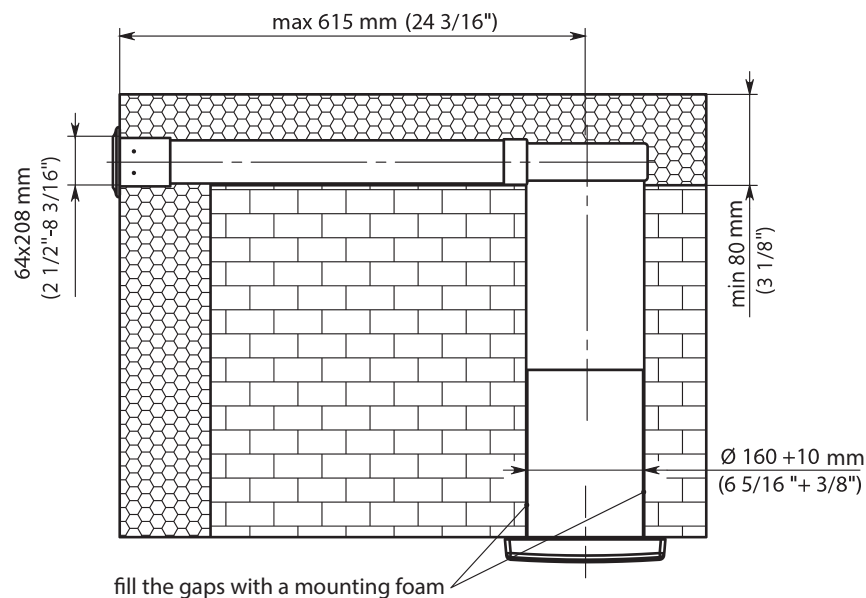


Fig. 12. Mounting of the single-room reversible ventilator TwinFresh R-50-5

The control and the transformer unit must be installed in a specially designed and prepared hole in a wall as shown in fig. 13, in inaccessible for children places. While installation consider the length of the cable supplied with the unit. A longer cable may be used. The recommended cable type and mark are shown in fig. 1-3.

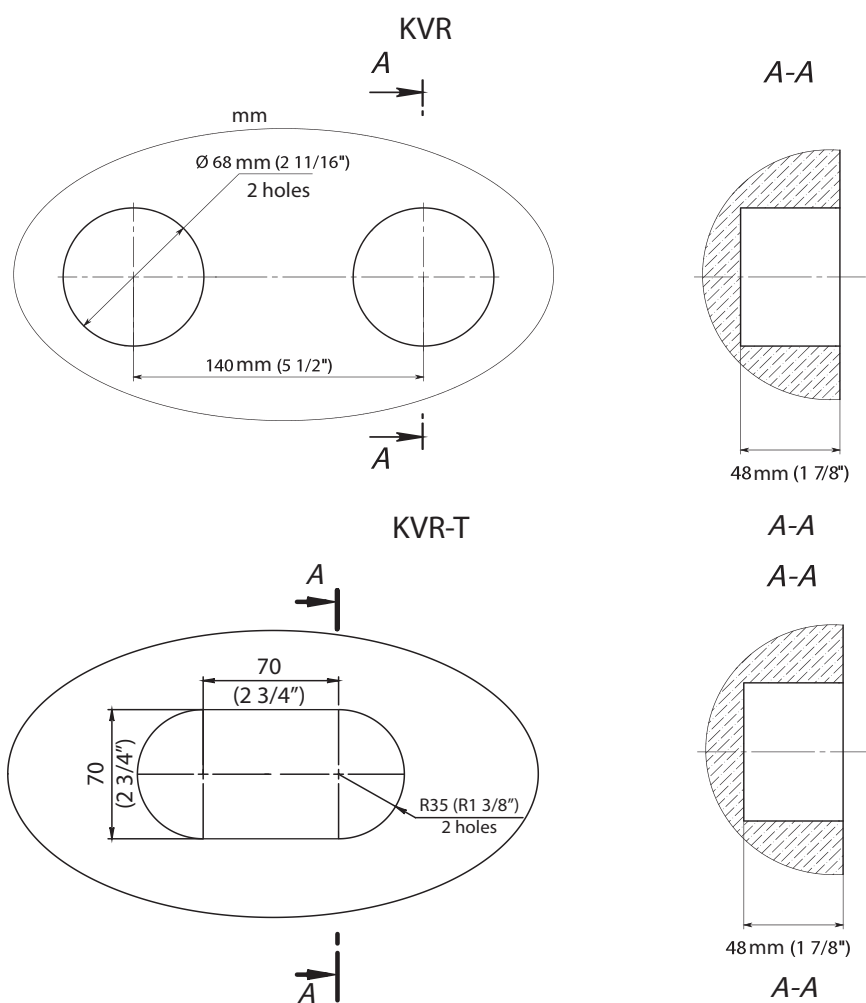


Fig. 13. Hole spacing for mounting of the control unit and transformer unit.



## CONNECTION AND CONTROL

The external control unit KVR is used for controlling of the TwinFresh R-50 unit. It is available upon order if not included into delivery set of the unit modification.

The control and power unit enables controlling set operation modes and consists of the control unit and transformer unit, fig. 14.

The unit is rated for connection to single-phase 230 V / 50 Hz or 120 V / 60 Hz depending on a transformer type. Separate power supply must be provided both to the control and power unit and to the ventilator.

The control and transformer unit may be replaced with a control and power unit with the interconnected controller and the transformer installed in a common junction box.

The control and power unit modification type is selected depending on the power mains voltage and power transformer in accordance with the table 5.

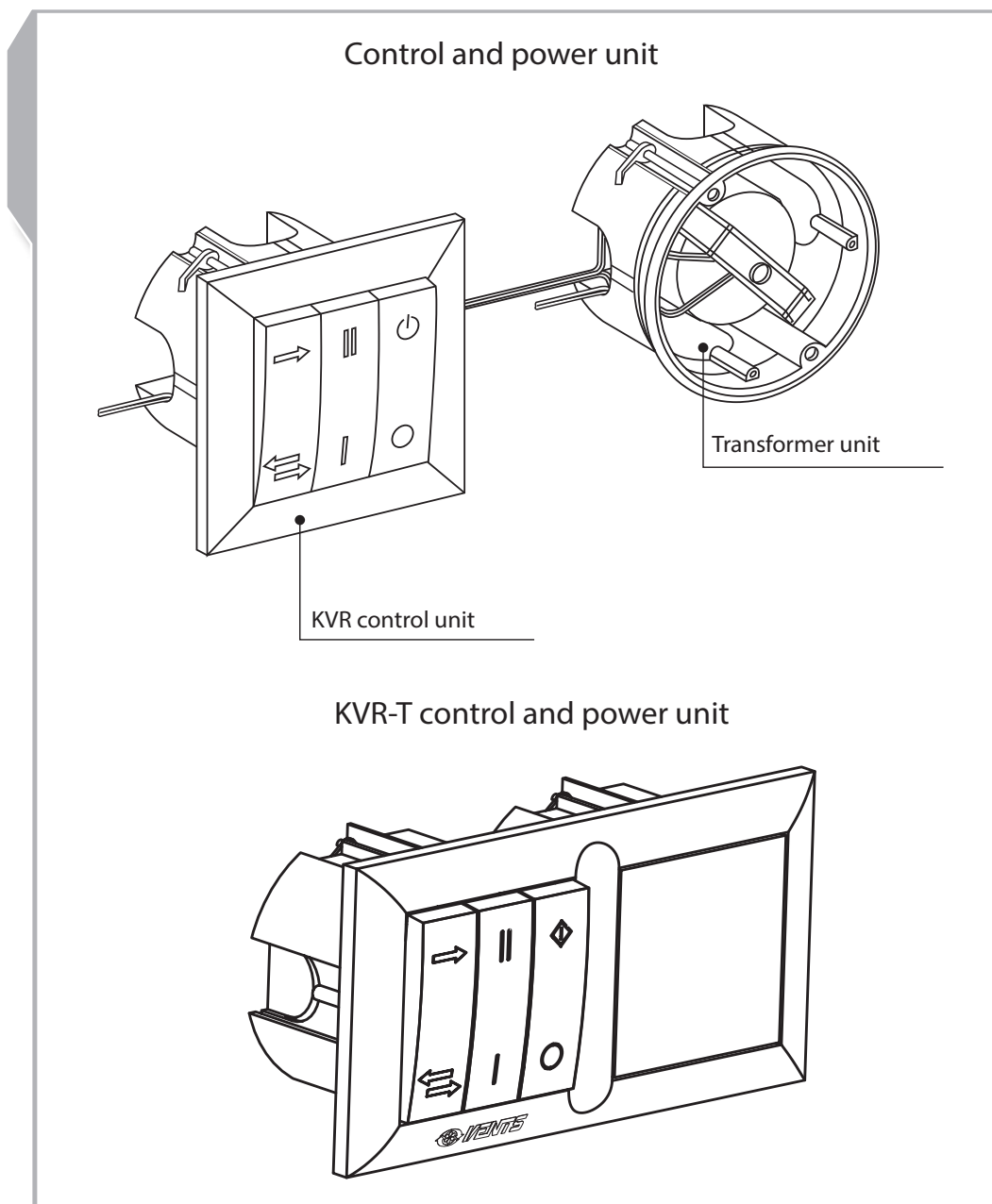


Fig. 14. KVR and KVR-T control unit (overall view)

Table 11

Control and power unit name	Transformer parameters			Note
	Power [W]	Voltage [V]		
		Input	Output	
KVR-T-6	6	230/50 Hz	12	Connection up to 2 units
KVR-T-6 (120 V/60 Hz)		120/60 Hz		
KVR-T-12	12	230/50 Hz	12	Connection up to 4 units
KVR-T-12 (120 V/60 Hz)		120/60 Hz		

The control unit is a three-key switch with an integrated printed circuit board for installation into a standard junction box.

All electric connection to the control unit and the ventilator are performed with the socket connectors for mounting and servicing facilitation. Each mating part of the connector has a colour marking in compliance with marking on the circuit board to ensure correct and quick electric installation.

The KVR control unit is used to set one of four operation modes of the unit, fig. 15:

1. Ventilation mode (air extract / air supply)\* at first speed with air capacity 25 m<sup>3</sup>/h (14.7 CFM).
2. Ventilation mode (air extract / air supply)\* at second speed with air capacity 50 m<sup>3</sup>/h (29.4 CFM).
3. Reverse (heat recovery) operation at first speed with air capacity 25 m<sup>3</sup>/h (14.7 CFM). The ventilator changes operation mode (air extract / air supply) every 70 seconds.
4. Reverse (heat recovery) operation at second speed with air capacity 50 m<sup>3</sup>/h (29.4 CFM). The ventilator changes operation mode (air extract / air supply) every 70 seconds.

\* - air flow direction depends on position of the jumper JMP1 on the circuit board. The jumper is set to provide supply mode by default, fig. 16.

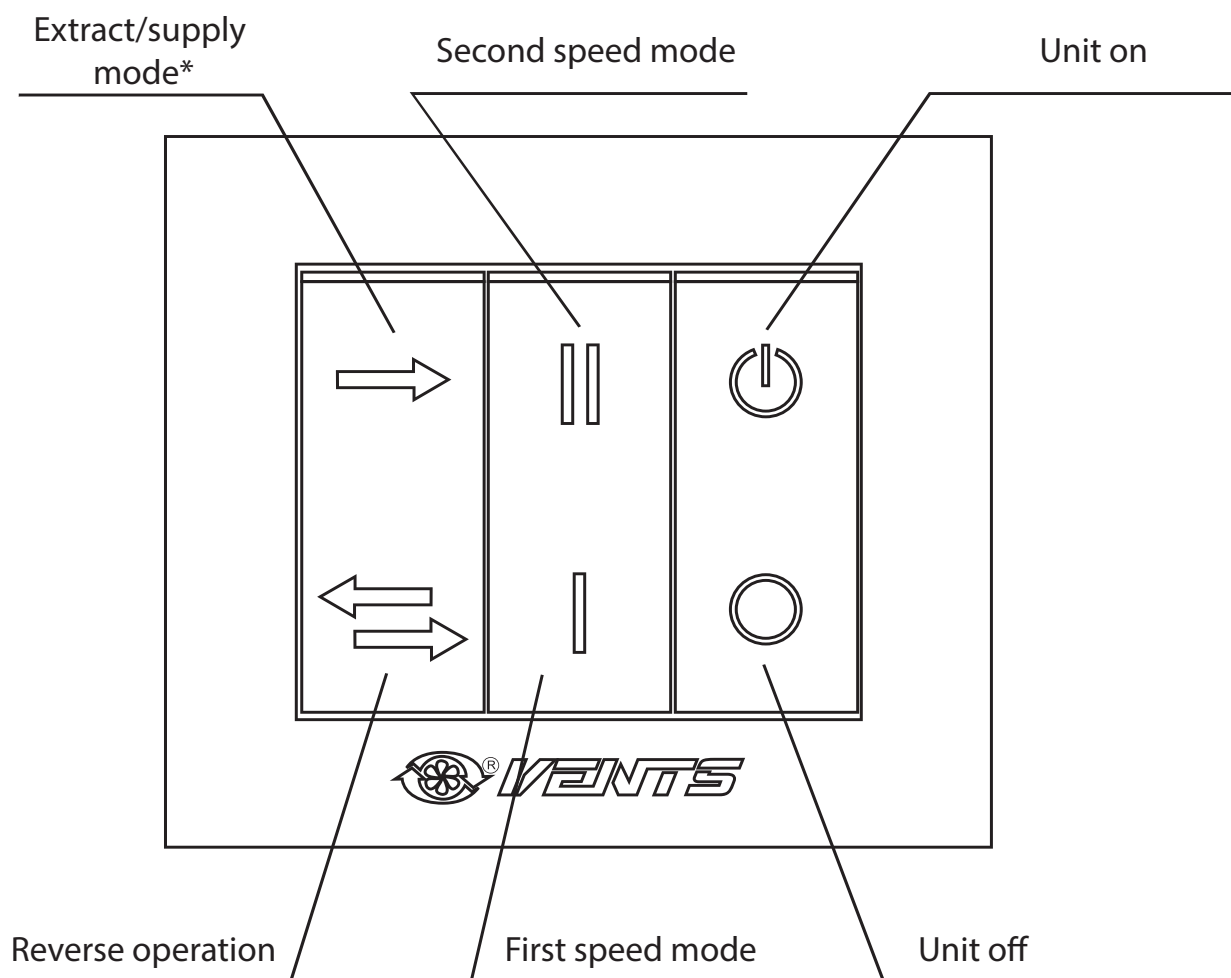
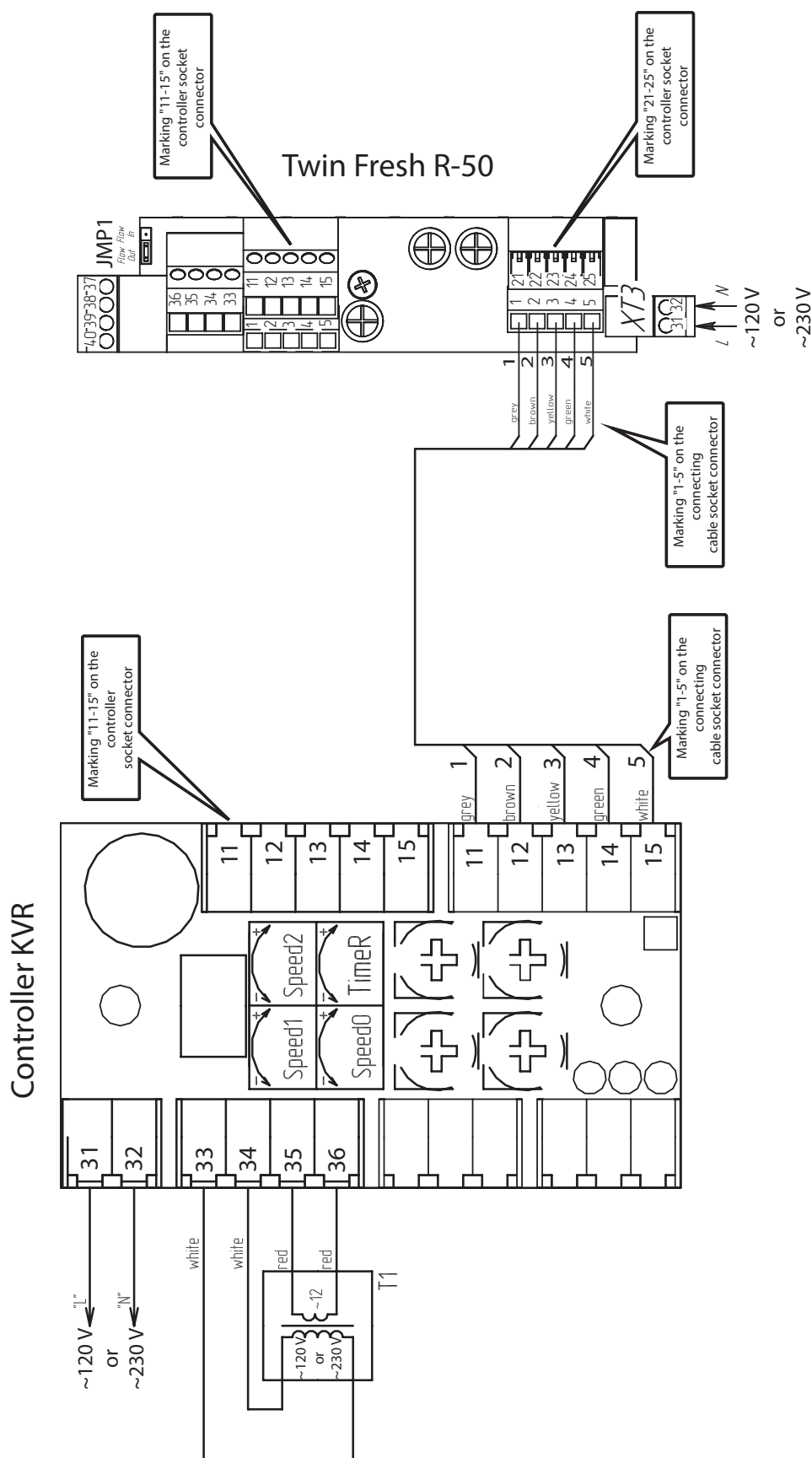


Fig. 15. Operation mode control unit



General wiring diagram for the unit connection to KVR controller is shown in fig. 16. The TwinFresh R-50 unit is connected to the KVR controller with two channels. Such connection solution provides flexible operation mode for several interconnected units. The units connected to the channel A operate in supply mode and the units connected to the channel B operate in exhaust mode. This operation logic is provided by the jumper on the circuit board of the TwinFresh R-50 units in Flow in position. In ventilation mode all the connected units operate in air extract mode (the JMP1 jumper on the circuit board is in Flow out position) or in supply mode (the JMP1 jumper on the circuit board is in Flow in position). The electric connection is performed with a five-wire cable. The wires are marked in compliance with the delivered cable for easy installation. The minimum conductor cross section is 0.25 mm<sup>2</sup> (23 AWG). Type and power of the step-down transformer T1 is selected on the assumption that the alternating current 12 V and power consumption 3 W is required for correct operation of one unit. Power supply 230 V / 50 Hz or 120 V / 60 Hz must be provided both to KVR (KVR-T) control unit and to the fan (socket connectors 3-21 in each case).

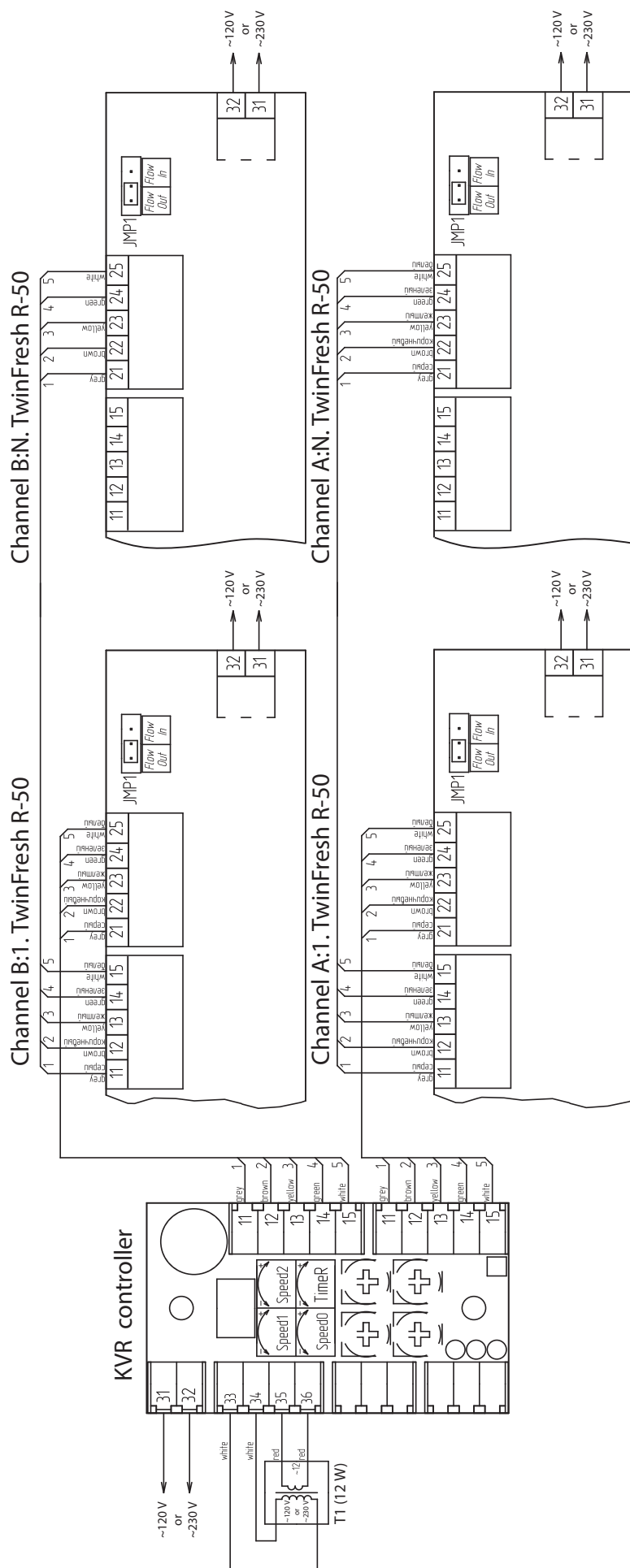


Fig. 17. General wiring diagram for connection of up to 4 TwinFresh R-50 units to KVR controller

To connect from 2 to 4 TwinFresh R-50 units, follow the wiring diagram in fig. 17. This wiring example shows connection through 12 W power transformer or 12 W control and power unit. Power supply 230 V / 50 Hz or 120 V / 60 Hz must be provided both to KVR (KVR-T) control unit and to each fan (socket connectors 31-21 for each case).

The inputs at the controller socket connectors are marked 21 to 25.

The outputs at the controller socket connectors are marked 11 to 15.

The socket connectors on the delivered connecting cable are marked 1 to 5 and are designed for connection to the controller socket connectors, 11-15 for outputs and 21-25 for inputs.



Connection sequence:

Connect the 12 V transformer leads to the terminals A1:35, 36 of A1 (KVR) controller by means of the socket connector on the cable K2. K2 cable is supplied with 40 W transformer unit. Then connect the first fan A3-no.1 to A1:11...15 terminals of KVR controller through the delivered connecting cable supplied with the first fan. Connect the second fan A3-no.2 (terminals A2: 21...25) to the first fan (terminals A2: 11...15) through the connecting cable supplied with the second fan. Connect the other fans (up to 12 items) in the same way. Provide 230 V or 120 V power supply to the terminals A2: 31, 32 of each fan. The rotation direction of the fans is determined by JMP1 jumper position on the A2 fan circuit board: the utmost left position sets the fans into exhaust mode (Flow Out), the utmost right position sets the fan into supply mode (Flow In). The jumper position sets rotation direction for each of the fan in the group. Power is supplied to the transformer unit through the power cable with a plug, which is pre-wired to the transformed terminal block by the manufacturer.

## MAINTENANCE

Disconnect the ventilator from power supply before any maintenance operation with the unit. Maintenance of the unit means regular cleaning of the unit surfaces from dust and cleaning or replacement of the unit filters.

Removing of the heat exchanger and the filter: first take off the front panel, unscrew the fasteners, disconnect and remove the fan and the distance ring. The heat exchanger is equipped with a special cord to facilitate its withdrawal together with the filters, fig. 19.

Clean the unit from dust with a soft brush, cloth or compressed air. Do not use water, abrasive detergents, solvents, sharp objects. The impeller blades must be cleaned once in year.

Clean the filters as often as these gets soiled, but at least once in 5-6 months. Cleaning with a vacuum cleaner is allowed. The filters must be replaced after two consecutive cleaning (1-2 times in year). For the new filters, contact the seller.

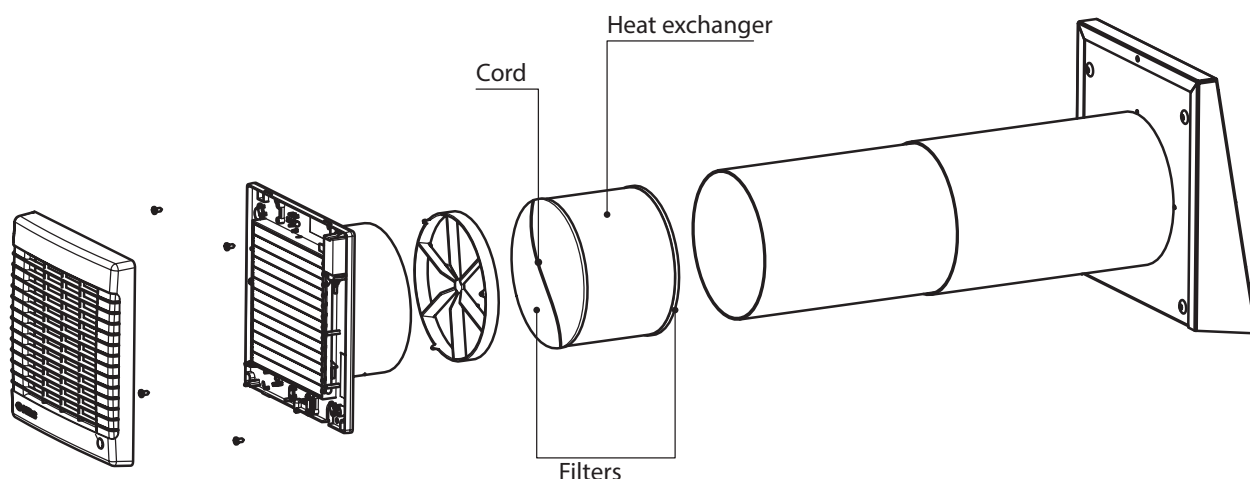


Fig. 19. Unit maintenance

## STORAGE AND TRANSPORTATION RULES

Store the unit in the manufacturer's original packing box in a dry ventilated premise at the temperatures from +10°C (14°F) up to +40°C (104°F).

Storage environment must not contain aggressive vapours and chemical mixtures provoking corrosion, insulation and sealing deformation.

Use hoist machinery for handling and storage operations to prevent the unit damage in consequence of falling or excessive oscillation. Fulfil the handling requirements applicable for the applicable freight type.

Transportation with any vehicle type is allowed provided that the unit is protected against mechanical and weather damage.

Avoid any mechanical shocks and strokes during handling operations.

## MANUFACTURER'S WARRANTY

Manufacturer hereby guarantees normal performance of the unit during two years from the date of retail sale provided compliance with transport, storage, mounting and operation regulations. In case of no confirmation of sales date the warranty period is calculated from the production date.

In case of failures in the unit operation during the warranty period the manufacturer will accept claims and complaints from a customer only after receiving a technical protocol with a fault description.

The unit damage as a result of unauthorized modifications in the electric circuit diagram is not a warranty case.

For warranty and post-warranty services contact the product manufacturer or the Seller. In case of warranty claim please submit the present user's manual with a stamp of the trade company, filled connection certificate and the warranty card. Both warranty and post-warranty services are carried out at the manufacturing facility. In case of warranty claim please provide the filled guarantee card with the trade company stamp and the user manual.



**THE MANUFACTURER IS NOT RESPONSIBLE FOR ANY DAMAGES RESULTING FROM THE UNIT MISUSE OR GROSS MECHANICAL INTERFERENCE. FOLLOW THE USER'S MANUAL REQUIREMENTS TO ENSURE NON-STOP AND TROUBLE-FREE OPERATION OF THE UNIT.**

## ACCEPTANCE CERTIFICATE

**The single-room reversible ventilator TwinFresh R-50 has been duly certified as serviceable.**

We hereby declare that the product complies with the essential protection requirements of Electromagnetic Council Directive 2004/108/EC, 89/336/EEC and Low Voltage Directive 2006/95/EC, 73/23/EEC and CE-marking Directive 93/68/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility.

This certificate is issued following test carried out on samples of the product referred to above.

Stamp of the acceptance inspector

Date of production \_\_\_\_\_

**Sold by**

Name of the trade company, stamp of the shop

Date of sale \_\_\_\_\_

## CONNECTION CERTIFICATE

The single-room reversible ventilator TwinFresh R-50 has been connected to power mains pursuant to the guidelines of the user's operation manual by the electrician:

Company name \_\_\_\_\_

Electrician's name \_\_\_\_\_

Date \_\_\_\_\_ Signature \_\_\_\_\_

## WARRANTY CARD

